

REMARKS

Responsive to the first Office action dated May 10, 2006, applicant has amended claims 1 and 6, and requests a Notice of Allowance of all pending claims for reasons that follow. In the Office action, the Examiner rejected all six pending claims as anticipated or obvious. Specifically,

- Claims 1, 2, 5, and 6 were rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 5,282,251 to Petersen.
- Claims 3 and 4 were rejected under 35 U.S.C. § 103(a) as unpatentable over Petersen.

Applicant traverses the prior-art rejections and respectfully requests reconsideration of the application. Petersen neither teaches nor suggests applicant's claimed invention, as amended.

Claim Rejections

The Examiner rejected claims 1-6 as anticipated by or obvious in view of Petersen. Petersen neither teaches nor suggests applicant's claimed invention. For example, and unlike the comments in the Office action, Petersen does not include "a second volume control configured to change the volume of the second sound source without affecting the volume of the first sound source," as required by claim 5.

Nevertheless, to further prosecution of the application, applicant has clarified certain features recited in amended independent claims 1 and 6 to focus on one distinguishing feature, namely that the second sound source is positioned so that, as recited by amended claim 1, "sound from the second sound source is directed vertically from above the hearing-impaired listener".

As required by both amended independent claims 1 and 6, applicant's invention requires positioning of the second sound source so that "sound from the second sound source is directed vertically from above the hearing-impaired listener". As described in further detail below, this feature maximizes the direct to indirect sound ratio and reduces reverberation (t-time).

In addition, the above-identified feature that is recited in amended claims 1 and 6 provides what is known as vertical vectoring of the sound. With vertically vectored sound, there is improved comprehension of dialogue because that vertical vectoring effectively eliminates indirect and reverberant elements of sound. Indirect and reverberant sounds are present when sounds are horizontally vectored as in all existing TV chassis speakers and "surround sound" systems.

The invention also overcomes listening problems caused by sound reflection and reverberation. First applicant will provide background on those two sound phenomena. When sounds propagate from a source, direct sound travels directly to the listener while indirect sound first strikes surrounding walls and objects and arrives at a listener's ears as much as seconds later. The intensity of the reflections depends on the construction of the room in which the listener is located, as well as the construction of objects that are located in that room. Speech comprehension decreases as the ratio of direct to indirect sound decreases. Reverberation is the process by which indirect sound fades or decays with time. Reverberation time increases with the volume of a room, and with the greater reflective properties of walls and objects within the room. For example, a sound that is directed into a sound absorbing material will obviously be less reverberant. It has been shown that speech intelligibility decreases as reverberation time increases.

As required by amended claims 1 and 6, “the second sound source is directed vertically from above the hearing-impaired listener.” This new and non-obvious positioning of the second sound source allows for the vertically vectoring of the sound, which eliminates or substantially reduces indirect sound and reverberation, thereby eliminating/substantially reducing the hearing-related problems attendant those phenomena.

Turning to the primary reference, Petersen discloses a portable speaker system for the hearing impaired. The system includes at least two speakers mounted on a moveable framework. As shown below in Figure 1 from Petersen, the framework may be positioned about a chair so that one speaker is directed toward a listener's left ear and the other speaker is directed toward the listener's right ear.

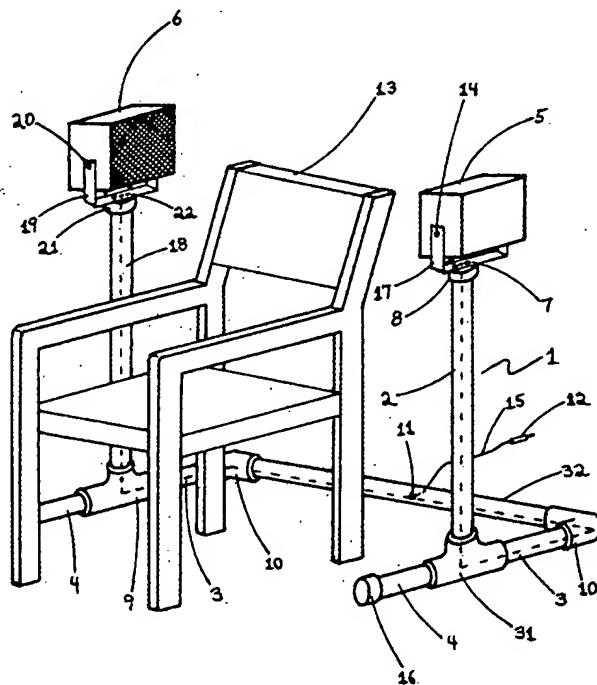


Figure 1 from Petersen

The height of the speakers corresponds to the height of a seated listener's ears (see, e.g., Figure 1 and claim 1 from Petersen), and the speakers are positioned to direct the sound horizontally from both sides of the listener.

In contrast, as amended, applicant's claimed invention is an assistive-listening system having a support structure that positions a sound source generally above a hearing-impaired listener's head, so that sound is directed generally downward onto the hearing-impaired listener, rather than horizontally toward the hearing-impaired listener as in Petersen. Differences in these two configurations may be seen by comparing Figure 1 from Petersen with the embodiment of applicant's invention shown in Figure 6 from the application.

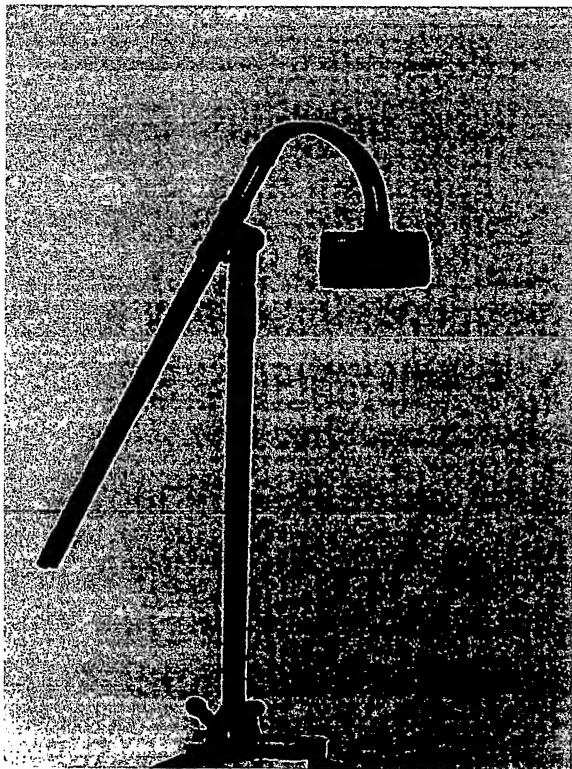


Figure 6A from Application



Figure 6B from Application

Positioning a sound source generally above a hearing-impaired listener's head is neither taught nor suggested by Petersen. The portable speaker system in Petersen uses two oppositely directed speakers to direct sound toward each of a listener's two ears. The speakers are shown positioned at ear level. Petersen, Figure 1. The speakers are described as positioned so that a seated user is positioned "between the speakers," with the "speakers directly focused into each ear." Petersen, column 2, lines 13, 18, and 19. The speakers also are described as positioned at "a height as to direct an audio sound emanating from said speakers directly towards the ear of the listener." Petersen, column 4, lines 11-13 (emphasis added). There is no teaching or suggestion that the speakers be positioned anywhere else, let alone generally above a listener. Moreover, positioning the speakers above the listener may be inconsistent with the notion of directly focusing the speakers into a listener's ears.

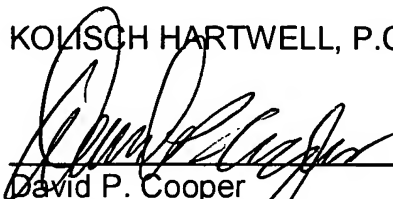
Positioning a sound source generally above a hearing-impaired listener's head provide substantial advantages over positioning a sound source at ear level as taught by Petersen. Those advantages were described above in connection with the discussion on indirect sound and reverberation. In addition to that discussion, applicant notes that positioning a sound source generally above a listener may reduce indirect sound and reverberation because sound will be directed onto sound-absorbing surfaces, such as the carpet, chair, and listener's body, rather than onto sound-reflective surfaces, such as walls and ceilings. Application, page 7, lines 17-21. Reduced reverberation can increase speech intelligibility, so that the invention of amended claims 1 and 6 provides increased sound level and improved sound quality, both important to hearing-impaired listeners. Positioning a sound source generally

above a listener also will reduce the sound directed at other listeners, so that non-hearing-impaired listeners are less likely to be subjected to potentially uncomfortable sound levels.

Accordingly, and for reasons described above, applicant respectfully requests allowance of all amended claims. If a telephone interview would in any way advance prosecution of the application, please contact applicant's attorney David P. Cooper at the address and telephone number indicated below.

Respectfully submitted,

KOLISCH HARTWELL, P.C.



David P. Cooper

Registration No. 33,372

PTO Customer No. 23581

520 S.W. Yamhill Street, Suite 200

Portland, Oregon 97204

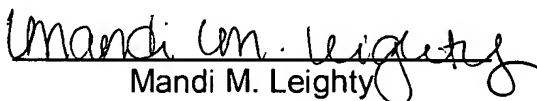
Telephone: (503) 224-6655

Facsimile: (503) 295-6679

Of Attorneys for Applicant

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: MAIL STOP: AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on November 13, 2006.



Mandi M. Leighty